

REMARKS

Claims 1, 3-15, 19 and 21 are now in the application. Claims 2, 16, 17, 18 and 20 have been cancelled without prejudice or disclaimer. Claim 1 has been amended to recite “wherein said organic unit containing two or more carbon atoms has a cyclic structure” from original claim 2. Claim 5 has been amended to recite “A_{Q3}/A_{Q4}” in place of “AQ3/AQ4”, “Q³” in place of “Q3”, “Q⁴” in place of “Q4” and “₂₉Si” in place of “29Si” for purposes of clarification and not to limit its scope.

Claim 9 has been amended to recite “A method of producing the fire retardant resin composition according to Claim 1” in place of “A method of producing a fire retardant resin composition comprising a polyphenol compound and an inorganic microfine particle”. In view of amending claim 9 to depend upon claim 1, it is requested that claim 9 be rejoined and examined along with the other elected claims. This is consistent with the PCT unity of invention rules which are applicable in this application, which is the US national stage of the PCT application.

The amendments to the claims and newly presented claim do not introduce any new matter. Claims 1, 3-15, 19 and 21 are deemed to be directed to the elected invention.

Claims 1-8, 10-15 and 17-20 were rejected under 35 USC 102(b) as being anticipated by or under 35 USC 103(a) as being obvious over US Patent 5,834,551 to Haraguchi et al. (hereinafter also referred to as “Haraguchi”). Haraguchi fails to anticipate and fails to render obvious the present invention.

Haraguchi et al. suggest a composite of a thermosetting resin with a metallic oxide, which is obtained by using a phenolic resin. However, the phenolic resin described in Haraguchi et al differs from the polyphenol compound described in the present invention in structure.

It is common knowledge to those skilled in the art that “a phenolic resin” usually consists of such a structure where aromatic units having phenolic hydroxyl groups are connected to one another through a methylene group containing one carbon atom, as mentioned on page 2, lines 21 to 24 of the present disclosure. In contrast, the polyphenol compound according to the present invention has a structure where aromatic units each having at least one phenolic hydroxyl group are connected to one another through an organic unit containing two or more

carbon atoms.

Claims 1-8, 10-15 and 17-20 were rejected under 35 USC 102(e) as being anticipated by or under 35 USC 103(a) as being obvious over US Patent 6,441,106 to Goda et al. (hereinafter also referred to as “Goda” or US Patent 6,337,363 to Lee et al. (hereinafter also referred to as “Lee”). Goda et al. and Lee et al. fail to anticipate and fail to render obvious the present invention.

Goda et al. suggest a curing agent for epoxy resin containing a siloxane-modified phenol resin obtained by using a phenol resin. However, the phenol resin (= phenolic resin) described in Goda et al. also differs from the polyphenol compound described in the present invention, as mentioned above. Further, the siloxane-modified phenol resin is constituted different from the fire retardant resin composition of the present invention, as will be discussed hereinbelow.

Lee et al. suggest an epoxy resin composition comprising an epoxy resin such as a bisphenol A type epoxy resin, a phenolic novolac hardener, and a silica-novolac hybrid resin solution. However, Lee et al. fail to teach or fairly suggest the polyphenol compound described in the present invention. To begin with, the epoxy resin in Lee et al. is an epoxy compound and not a “polyphenol” compound. Further, for example, a bisphenol A composing the epoxy resin has a structure where aromatic units each having one phenolic hydroxyl group are connected to one another through the group represented “-C(CH₃)₂-”.

In contrast, the polyphenol compound in the present invention has a structure where aromatic units each having at least one phenolic hydroxyl group are connected to one another through an organic unit containing two or more carbon atoms, wherein the organic unit has a cyclic structure, as now recited in amended claim 1.

Therefore, the epoxy resin in Lee et al clearly differs from the polyphenol compound employed in the present invention. Moreover, the phenolic novolac hardener in Lee et al, which is a phenolic novolac resin as mentioned on column 2, line 34 to 35 in Lee et al., usually consists of a structure where aromatic units having phenolic hydroxyl groups are connected to one another through a methylene group containing one carbon atom.

The above cited references fail to anticipate the present invention. In particular, anticipation requires the disclosure, in a prior art reference, of each and every recitation as set forth in the claims. *See Titanium Metals Corp. v. Banner*, 227 USPQ 773 (Fed. Cir. 1985),

Orthokinetics, Inc. v. Safety Travel Chairs, Inc., 1 USPQ2d 1081 (Fed. Cir. 1986), and *Akzo N.V. v. U.S. International Trade Commissioner*, 1 USPQ2d 1241 (Fed. Cir. 1986).

There must be no difference between the claimed invention and reference disclosure for an anticipation rejection under 35 U.S.C. 102. *See Scripps Clinic and Research Foundation v. Genentech, Inc.*, 18 USPQ2d 1001 (CAFC 1991) and *Studiengesellschaft Kohle GmbH v. Dart Industries*, 220 USPQ 841 (CAFC 1984).

To the extent, inherency is being relied upon in the Office Action, the law is well settled that claiming of a more specific range within a more generic range and/or claiming species from a broader group of possible compounds avoids a lack of novelty rejection. The test for anticipation is whether the claims read on the prior art disclosure, not on what the references broadly teach.

For example, see *Akzo N.V. v. U.S. International Trade Commissioner* 1 USPQ2d 1241 (Fed. Cir. 1986). In *Akzo*, claims that were drawn to a process for making aramid fibers using a 98% sulfuric acid were not anticipated by a reference using a concentrated sulfuric acid solution but which did not specifically disclose that it was a 98% concentrated sulfuric acid solution. The disclosure of a concentrated sulfuric acid was not deemed an inherent disclosure of the more specific 98% sulfuric acid.

The court further found that no anticipation exists when one would have had to “randomly pick and choose among a number of different polyamides, a plurality of solvents and a range of inherent viscosities” to reach the claimed invention.

Also see *In re Kollman et al.* 201 USPQ 193 (CCPA-1979) wherein the court held that the prior art generic disclosure contains “no suggestion of the required FENAC/diphenyl ether ratio”.

An invention can not be rejected based on “inherency” because of probability or possibility of the presence of the constitution in the prior art. Please see *Crown Operations International Ltd. v. Solutia* 24 USPQ 2d 1917 (Fed. Cir. 2002).

Claims 1-8 and 17-20 were rejected under 35 USC 103(a) as being obvious over US Patent 5,177,157 to Akamatsu or US Patent 6,265,066 to Suzuki et al. (hereinafter also referred to as “Suzuki”). Akamatsu and Suzuki et al. fail to render obvious the claimed invention.

Akamatsu suggests a silicone resin-modified phenolic resin obtained by using a phenolic resin. However, the phenolic resin differs from the polyphenol compound in the present invention in structure, as discussed above.

Suzuki et al. fail to teach or fairly suggest the polyphenol compound described in the present invention.

As mentioned above, the fire retardant resin composition of the present invention is structurally different from the cited references in the structure of the polyphenol compound therein. Due to this significant difference, the present invention achieves superior results and advantages as compared to the cited references.

Along these lines, attached is a Declaration under 37 CFR 1.132 containing experimental data that demonstrates unexpected results achieved by the present invention relative to the cited references. In particular, the Declaration shows that the fire retardant resin composition comprising the polyphenol compound is excellent in fire retardancy as compared to a resin composition comprising a phenolic resin consisting of a structure where aromatic units having phenolic hydroxyl groups are connected to one another through a methylene group containing one carbon atom.

Furthermore, Goda et al. and Akamatsu suggest “a modified phenolic resin”. The siloxane-modified phenol resin discussed by Goda et al. is a so-called “hybrid molecule”, which contains a phenolic hydroxyl group as mentioned on column 3, lines 61 to 63, obtained by dealcoholization or esterification reaction between alkoxy silane and hydroxy group of the phenol resin.

The silicone-modified phenolic resin suggested by Akamatsu is also a so-called “hybrid molecule”, which is free of the diorganopolysiloxane unit, obtained by hydrolysis and condensation reaction of the alkoxy group in the alkoxy silane-modified novolac-type phenolic resin prepared by dealcoholization reaction between trialkoxy silane and the phenolic resin. These modified phenolic resins are constituted differently from the fire retardant resin compositions of the present invention.

In the fire retardant resin composition of the present invention, inorganic microfine particles, which are products of hydrolysis and condensation, are separately dispersed in the polyphenol compound.

In contrast, the modified phenolic resin of Goda et al. and Akamatsu is such that the inorganic component is contained in the phenolic resin at the molecular level. That is, the modified phenolic resin is also called as inorganic component-phenolic resin composite, and it is no longer a “composition” including a resin component and an inorganic component.

This difference produces remarkable distinction in fire retardancy and stability as shown below:

<Fire retardancy>

The fire retardant resin composition of the present invention has an inhibitory effect on transmission of combustion, since the inorganic microfine particles contained therein can act as a barrier on transmission of combustion.

On the other hand, the modified phenolic resin can not exhibit the inhibitory effect, since there is not a barrier in the particle state.

<Stability>

It is believed that the siloxane-modified phenol resin suggested by in Goda et al. has high activity of condensation reaction and tends to be of improved viscosity, since unreacted alkoxy groups remain in low-molecular-weight siloxane and be modified so as to retain a phenolic hydroxyl group.

It is also believed that the silicone-modified phenolic resin suggested by Akamatsu tends to be of improved viscosity with time, since it is a hybrid molecule and thereby unreacted groups such as a silanol group and alkoxysilyl group sterically tend to remain.

On the other hand, no unreacted groups remain in the fire retardant resin composition of the present invention, since the alkoxyasilane is condensed under such a condition that the alkoxyasilane is unaffected. Therefore, there is no problem in stability. The stability tends to at least minimize, if not eliminate, deterioration of the excellent fire retardancy properties of the compositions of the present invention over time.

The cited art lacks the necessary direction or incentive to those of ordinary skill in the art to render a rejection under 35 USC 103 sustainable. The cited art fails to provide the degree of predictability of success of achieving the properties attainable by the present invention, as evidenced by the attached Declaration, needed to sustain a rejection under 35 USC 103. See *KSR Int'l Co. v. Teleflex, Inc.*, supra, *Diversitech Corp. v. Century Steps, Inc.* 7 USPQ2d 1315 (Fed. Cir. 1988), *In re Mercier*, 187 USPQ 774 (CCPA 1975) and *In re Naylor*, 152 USPQ 106 (CCPA 1966).

Moreover, the properties of the subject matter and improvements which are inherent in the claimed subject matter and/or disclosed in the specification are to be considered when evaluating the question of obviousness under 35 USC 103. See *KSR Int'l Co. v. Teleflex, Inc.*, supra; *Gillette Co. v. S.C. Johnson & Son, Inc.*, 16 USPQ2d. 1923 (Fed. Cir. 1990), *In re Antonie*, 195 USPQ 6 (CCPA 1977), *In re Estes*, 164 USPQ 519 (CCPA 1970), and *In re Papesch*, 137 USPQ 43 (CCPA 1963).

No property can be ignored in determining patentability and comparing the claimed invention to the cited art. Along these lines, see *In re Papesch*, supra, *In re Burt et al*, 148 USPQ 548 (CCPA 1966), *In re Ward*, 141 USPQ 227 (CCPA 1964), and *In re Cescon*, 177 USPQ 264 (CCPA 1973).

The provisional rejection of claims 1-7, 10-15 and 17-20 under the judicially created doctrine of obviousness type double patenting as being unpatentable over the claims 2-5 of copending US application 11/197,587 has been overcome by the filing of a Terminal Disclaimer. The filing of the Terminal Disclaimer is not to be construed as an admission, estoppel or acquiescence. See *Quad Environmental Technology v. Union Sanitary District*, 20 USPQ2d 1392 (Fed. Cir. 1991) and *Ortho Pharmaceuticals Corp. v. Smith*, 22 USPQ2d 1119 (Fed. Cir.

1992).

In view of the above, consideration and allowance are, therefore, respectfully solicited.

In the event that the Examiner believes that an interview might serve to advance the prosecution of this application in any way, the undersigned attorney is available at the telephone number noted below.

Please charge any necessary fees or credit any overpayment to Deposit Account 22-0185, under Order No. 21581-00334-US1.

Dated: July 22, 2008

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